

November 13, 2019

**Ex Parte**

Marlene H. Dortch, Secretary  
Federal Communications Commission  
445 12th Street SW  
Washington, DC 20554

Re: Various Pending Requests to Waive the Commission’s Ultra-Wideband Rules;  
ET Docket Nos. 19-241, 19-242, 19-246, 19-155, 19-217, 19-89, 18-284; *Unlicensed Use of the 6 GHz Band*, ET Docket No. 18-295; *Expanding Flexible Use in Mid-Band Spectrum between 3.7 and 24 GHz*, GN Docket No. 17-183

Dear Ms. Dortch:

Recently, numerous parties have requested that the Commission waive its Ultra-Wideband (“UWB”) device rules in Part 15, Subpart F.<sup>1</sup> This bevy of requests must be understood as more than individual waiver filings. Taken together they could fundamentally change FCC policy on how UWB devices operate. Given the collective scope and breadth of the changes sought—which involve numerous technical requests to operate new types of radios, power levels, and/or deployment modes—the Commission should not consider them on an *ad-hoc* basis. Rather, as the Commission has recognized, such “issues of general applicability” are better resolved through a more comprehensive proceeding.<sup>2</sup>

*1. The Surge in Recent UWB Waiver Requests Raises Issues of General Applicability.*

Numerous companies have recently requested authority to operate UWB devices outside the scope of existing UWB rules. Taken together, these requests have the potential to impact many different frequency bands used by a number of services, some of which are the subject of active or recent rulemaking proceedings before the FCC. A review of these requests reveals the scope and importance of the changes that face the Commission.

A request by WaveSense, Inc., for example, asks for a waiver of Section 15.509(b) to allow the use of 103-403 MHz ground penetrating radar (“GPR”) in the automobile safety field and of Section 15.525 to allow for its use without coordination with federal users.<sup>3</sup> The GPS Innovation Alliance (“GPSIA”) contends, in response, that a blanket waiver of the rules is not

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<sup>1</sup> 47 C.F.R. §§ 15.501–15.525.

<sup>2</sup> See, e.g., *Applications for License and Authority to Operate in the 2155-2175 MHz Band*, Order, 22 FCC Rcd. 16,563 ¶ 28 (2007) (“*Applications for License and Authority Order*”).

<sup>3</sup> *WaveSense, Inc. Request for Waiver of the Commission’s Part 15 Rules Applicable to Ultra-Wideband Devices*, Request for Waiver, ET Docket No. 19-241 (filed July 25, 2019) (“WaveSense Request”).

appropriate and that the Commission should instead issue a conditional waiver for a limited number of evaluation kits.<sup>4</sup> Further, Aviation Spectrum Resources (“ASRI”) states that the two rules WaveSense seeks to waive were intended to ensure that GPR devices are “‘used infrequently with a low proliferation rate’ and only after coordination,” and argues that the request seeks to pave the way for general public use of GPR, thus “eviscerating” the effect of the rules.<sup>5</sup>

Humatics Corporation has requested a waiver of Section 15.519(a), seeking authorization for an UWB system operating from 3.1-4.8 GHz that would use otherwise prohibited fixed infrastructure for industrial autonomous navigation.<sup>6</sup> GPSIA responds that there is a discrepancy between the scope of operations requested in the waiver and the scope of operations displayed by Humatics’ marketing materials and urges the Commission to confirm that “wide-scale urban deployment scenarios are outside of the scope” of the waiver request.<sup>7</sup> Although Humatics contends that fixed infrastructure UWB devices can be deployed “without any risk of harmful interference,” the applicable UWB rules specifically prohibit “any fixed outdoors infrastructure.”<sup>8</sup> And ASRI contends that more technical information is necessary in order to adequately assess the potential for interference to licensed systems.<sup>9</sup>

In a waiver request that involves an even wider frequency range—3200-3700 MHz, 4243-4743 MHz, and 6240-6740 MHz—Piper Networks asks the Commission to waive Sections 15.250(c)-(d) and 15.519(a)(2) to facilitate the installation of an UWB train positioning system using fixed wireless infrastructure under the handheld UWB device rule.<sup>10</sup> In 6240-6740 MHz, Piper proposes *both* to permit fixed outdoor transmission *and* to raise the allowable radiated power (EIRP) by 6 dB, to operate at a power level of -35.3 dBm. The frequencies from 6240-6740 MHz are part of the larger 6 GHz band, currently the subject of a Commission

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<sup>4</sup> Comments of The GPS Innovation Alliance at 4-5, ET Docket No. 19-241 (filed Sept. 16, 2019).

<sup>5</sup> Comments of Aviation Spectrum Resources, Inc. at 7, ET Docket No. 19-241 (filed Sept. 16, 2019).

<sup>6</sup> *Humatics Corporation Request for Waiver of Section 15.519(a) of the Commission’s Rules*, Request for Waiver, ET Docket No. 19-242 (filed July 16, 2019) (“Humatics Waiver Request”); Reply Comments of Humatics Corporation at 8, ET Docket No. 19-242 (filed Oct. 1, 2019).

<sup>7</sup> Comments of The GPS Innovation Alliance at 4-5, ET Docket No. 19-242 (filed Sept. 16, 2019).

<sup>8</sup> Humatics Waiver Request at 1; 47 C.F.R. § 15.519(a)(2).

<sup>9</sup> Reply Comments of Aviation Spectrum Resources, Inc., ET Docket No. 19-242 (filed Oct. 1, 2019).

<sup>10</sup> *Request by Piper Networks, Inc. For Waiver of Sections 15.250(c)-(d) and 15.519(a) of the Commission’s Rules*, Request for Waiver, ET Docket No. 19-246 (filed June 6, 2019) (“Piper Waiver Request”).

rulemaking. In 3200-3700 and 4243-4743 MHz, Piper asks the Commission to permit outdoor operations and fixed non-handheld applications, potentially impacting federal spectrum and affecting the new operations in the 3.5 GHz CBRs band. ASRI argues that UWB systems operating under the requested waiver could also potentially interfere with Wireless Avionics Intra-Communications in the 4.2-4.4 GHz radio altimeter band, especially because train systems often operate at and around airports.<sup>11</sup>

Liberty Defense Holdings requests a waiver of sections 15.31(c), 15.503(d), 15.511(b), 15.511(f), and 15.521(d) to facilitate an UWB imaging system that will operate in the 6-10.6 GHz range to detect weapons, firearms, and explosives.<sup>12</sup> It seeks to operate outside of the current UWB rules by using a swept frequency approach and expanding the eligible users of the system beyond those specified in the rules.

Another company, Geophysical Survey Systems, also requests a waiver of the UWB rules to operate GPR systems between 103 and 403 MHz.<sup>13</sup> It requests waivers of the rules in sections 15.31(c) and 15.503(d) to allow a stepped frequency configuration and a swept measurement method, with operations at 51 frequencies between 103 and 403 MHz, at 6-MHz intervals. It also requests a waiver of the user eligibility rules for GPR to allow a vehicle safety application. ASRI argues that devices operating under waiver could impact aviation services in 117.975-137 MHz, and has requested that the Commission specifically protect that frequency range from intentional emissions.<sup>14</sup>

The Massachusetts Institute of Technology requests waivers of the definition of UWB transmitter, the measurement standards for swept frequency equipment, and measurement procedures, to allow operations supporting the WiTrack system, a monitoring system for patients and senior adults that uses an indoor swept signal in the 6-8.5 GHz range.<sup>15</sup>

Finally, Metrom Rail, in a waiver request that has been pending for over a year, asks the Commission to waive Sections 15.519(a) and (c) to authorize UWB positive train control systems in 3.272-5.014 GHz that would operate above the current radiated power limit where a

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<sup>11</sup> Comments of Aviation Spectrum Resources, Inc. at 5, ET Docket No. 19-246 (filed Sept. 23, 2019).

<sup>12</sup> *Liberty Defense Holdings, Ltd. d/b/a Liberty Defense Technologies Request for Waiver of Sections 15.31(c), 15.503(d), 15.511(b), 15.511(f) and 15.521(d) of the Commission's Rules*, Request for Waiver, ET Docket No. 19-217 (filed May 8, 2019).

<sup>13</sup> *Geophysical Survey Systems, Inc., Request for Waiver of Part 15 of the Commission's Rules to Market an Ultra-Wideband Evaluation Kit*, Request for Waiver, ET Docket No. 19-155 (filed Apr. 11, 2019).

<sup>14</sup> Letter from Andrew C. Roy, Director of Engineering, Aviation Spectrum Resources, Inc., to Marlene H. Dortch, Secretary, FCC, ET Docket No. 19-155 (filed August 7, 2019).

<sup>15</sup> *Massachusetts Institute of Technology Request for Waiver of Part 15 of the Commission's Rules Applicable to Ultra-Wideband Devices*, Request for Waiver, ET Docket No. 19-89 (filed Dec. 27, 2018).

directional antenna is necessary.<sup>16</sup> It also requests permission to install and operate the positive train control system as fixed wireless infrastructure under the handheld UWB waiver device rules. Although Metrom contends that waiving this rule and allowing its UWB devices to be mounted on trains and on the sides of tracks would be similar to allowing train operators to use handheld devices,<sup>17</sup> the UWB rules specifically prohibit “[t]he use of antennas mounted on outdoor structures, e.g., antennas mounted on the outside of a building or on a telephone pole, or any fixed outdoors infrastructure.”<sup>18</sup> Metrom also requests transmissions from its directional antenna be permitted to exceed the current limit in the Commission’s rules by 6 dB to produce an EIRP of no more than -35.3 dBm because “the use of the directional antenna to supplement the omnidirectional antenna is necessary to gain additional signaling range,” increasing the range and reducing deployment costs.<sup>19</sup>

The National Public Safety Telecommunications Council states that “Metrom may not have considered potential interference to public safety 4.9 GHz operations in developing its request.”<sup>20</sup> NCTA and ACA both oppose Metrom’s request until it submits a detailed interference analysis showing that the increased power levels would not cause harmful interference to satellite downlink earth stations between 3.7-4.2 GHz and states that the FCC should not consider the waiver request until after the rulemaking considering expanded terrestrial access in the 3.7-4.2 GHz band is concluded.<sup>21</sup> Although Metrom references the 3.5 GHz CBRS band, it does not discuss how its proposed operations would coexist with the forthcoming new operations in that band.

These numerous requests to operate outside the current scope of the UWB rules implicate the Commission’s basic policies on UWB operations and raise generally applicable issues that make them inappropriate for waivers. Notwithstanding the fact that some petitions reference individual bands, the petitions often impact huge frequency ranges. For example, Metrom’s filing requests a waiver of two sub-parts of the UWB rules, but the waiver request affects, at a minimum, three separate licensed bands (4.9 GHz, 3.7-4.2 GHz, and 3550-3700 MHz) two of which are the subject of recent or current rulemaking proceedings at the FCC, and a wide range of commercial and federal incumbent users. The Humatics request involves UWB operations

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<sup>16</sup> *Request by Metrom Rail, LLC For Waiver of Sections 15.519(a) and 15.519(c) of the Commission’s Rules*, Request for Waiver, ET Docket No. 18-284 (filed Sept. 4, 2018) (“Metrom Rail Petition”). *See also* Letter from Thomas S. Dombrowsky, Jr., Senior Engineering Advisor, DLA Piper LLP, to Marlene H. Dortch, Secretary, FCC, ET Docket No. 18-284 (filed October 29, 2019).

<sup>17</sup> Metrom Rail Petition at 11-14.

<sup>18</sup> 47 C.F.R. § 15.519(a)(2).

<sup>19</sup> Metrom Rail Petition at 17.

<sup>20</sup> Reply Comments of The National Public Safety Telecommunications Council at 8, ET Docket No. 18-284 (filed Nov. 6, 2018).

<sup>21</sup> Reply Comments of NCTA – The Internet & Television Association and the American Cable Association, ET Docket No. 18-284 (filed Nov. 6, 2018).

from 3.1-4.8 GHz, which similarly overlaps with the CBRS band and C-Band, along with use of radio altimeters in the 4.2-4.4 GHz band. Further, Commission decisions to grant requests referencing specific bands have the potential to have wide-ranging impacts on many other UWB frequencies as they will spur follow-on petitions claiming supposedly band-specific reasoning in past approvals must apply to new requests as well.

Together, just the various UWB-related waivers pending today involve at least ten different incumbent bands of commercial and federal spectrum, each with its own set of licensees and technical concerns. Indeed, in responding to the Geophysical Survey Systems request noted above, GPSIA notes the “multiple UWB waiver-related matters that are now pending or were recently before the Commission,” and urges the Commission to require a minimum set of uniform technical information before considering such requests so that all potentially affected parties can evaluate the potential impact of the proposed operations.<sup>22</sup>

## *2. The Commission Should Not Evaluate Changes to UWB Operations on an Ad-Hoc Basis.*

These numerous requests seek overlapping policy changes, implicate a large number of bands, have consequences for a diverse set of incumbent users, and will almost certainly be used by other companies in an attempt to generalize their waivers into effective rule changes. Consequently, they raise issues of general applicability such that waivers are inappropriate. If the Commission does consider them, it should do so through a comprehensive proceeding rather than on a piecemeal, *ad-hoc* basis.

Although the Commission generally has wide latitude to address waiver requests on an *ad-hoc* basis—particularly when an individual request presents “unique or unusual circumstances”—it has repeatedly recognized that waiver requests raising “issues of general applicability are more suited to rulemaking.”<sup>23</sup> As the Commission has explained, “[t]his preference is based on the principle that a rulemaking under the Administrative Procedure Act’s provisions for notice and broad public participation assures fairness, the opportunity to develop the record and mature consideration.”<sup>24</sup>

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<sup>22</sup> Comments of The GPS Innovation Alliance at 1-2, ET Docket No. 19-155 (filed June 19, 2019).

<sup>23</sup> See, e.g., *Applications for License and Authority Order* ¶ 28; *Amendment of Parts 2 and 25 of the Commission’s Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency*, Memorandum Opinion and Order and Second Report and Order, 17 FCC Rcd. 9614 ¶ 218 (2002) (“*Amendment of Parts 2 and 25 MO&O*”); *Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission’s Rules to Redesignate the 27.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies For Local Multipoint Distribution Service and For Fixed Satellite Services*, Second Report and Order, Order on Reconsideration and Fifth Notice of Proposed Rulemaking, 12 FCC Rcd. 12,545 ¶ 388 (1997).

<sup>24</sup> *Amendment of Parts 2 and 25 MO&O* ¶ 218 (footnote omitted).

Moreover, the Commission should be especially reluctant to grant waivers “when to do so would ‘invite numerous other waiver requests which, if granted, would effectively circumvent the Commission’s rulemaking function.’”<sup>25</sup> Significantly, Metrom Rail has already argued that other instances where the Commission has waived UWB rules justify its waiver request to install fixed UWB infrastructure otherwise prohibited by the rules.<sup>26</sup> Humatics and Piper Networks both make the same arguments in their waiver requests to operate an UWB system using fixed infrastructure.<sup>27</sup>

These considerations are particularly important where, as here, parties have filed a swarm of different waiver requests that involve the same rules. Adjudicating waiver requests in an *ad-hoc* manner can result in “uneven application of conditions,” and policymaking via waiver requests “place[s] an excessive administrative burden on the agency.”<sup>28</sup> As one commenter cautions, the end result of such “regulation by waiver” is an “odd patchwork of boundaries between permitted and non-permitted devices that makes no coherent sense.”<sup>29</sup>

By contrast, evaluating numerous proposed changes to UWB device operating parameters comprehensively rather than through *ad-hoc* adjudication would enable the Commission to consider requests consistently and better determine the collective impact of the requested changes. Avoiding *ad-hoc* adjudication would also help the Commission consider whether other licensed or unlicensed options would better serve the public interest because they would result in greater spectral efficiency or a reduced risk of harmful interference. For example, the Commission should confirm that other current or proposed Part 15 rules cannot accommodate the requested use cases before permitting UWB devices that operate in a manner inconsistent with the UWB rules.

### *3. UWB Proponents’ Advocacy in Other Proceedings Underscores the Need to Proceed Carefully with Any Changes to UWB Operations.*

The Commission has a decades-long track record of enabling innovative unlicensed technologies through its Part 15 rules—creating the success of Wi-Fi. This success is based on a model in which spectrum usage rights are governed by clear and simple FCC rules, with low barriers to entry without spectrum auctions, but where operators do not have the right to exclude other users or other technologies from the band. UWB devices are Part 15 devices. UWB device manufacturers do not pay for the right to exclude other users by participating in spectrum auctions or purchasing exclusive use licenses. Nevertheless, recently, UWB advocates in the

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<sup>25</sup> *Applications of Telecom Services Inc.*, Order on Reconsideration, 16 FCC Rcd. 18,623, 18,625 ¶ 8 (2001).

<sup>26</sup> Metrom Rail Petition at 20-21.

<sup>27</sup> Humatics Waiver Request at 14; Piper Waiver Request at 10.

<sup>28</sup> *Amendment of Parts 2 and 25 MO&O* ¶ 218.

<sup>29</sup> Mitchell Lazarus, *The FCC Waives the Ultra-Wideband Rules—Again*, CommLawBlog (June 9, 2011), <https://www.commlawblog.com/2011/06/articles/unlicensed-operations-and-emerging-technologies/the-fcc-waives-the-ultra-wideband-rules-again/>.

6 GHz proceeding have repeatedly asserted that the Commission should block innovative unlicensed uses because of purported spectrum interference risks to UWB devices.

For example, after the Commission granted iRobot a waiver of Section 15.250(c) in 2015, the company deployed a limited residential fixed outdoor infrastructure to operate its robotic lawn mower system in the 6240-6740 MHz range.<sup>30</sup> Today, tellingly, iRobot refers to itself and other Part 15 UWB devices as “6 GHz band incumbents” and contends that the Commission should avoid authorizing innovative Wi-Fi uses in order to protect iRobot’s Part 15 operations from interference.<sup>31</sup> Ironically, iRobot asserts that doing so is necessary to “avoid implicitly dedicating [6 GHz] spectrum to a single technology use case.”<sup>32</sup> Similarly, filings from the UWB Alliance in the 6 GHz proceeding ask the Commission to delay promulgating new rules for the 6 GHz band, because of purported interference to their members’ Part 15 devices.<sup>33</sup>

This advocacy suggests that UWB companies will take any permission to expand their unlicensed operations as an opportunity to assert “incumbent” rights to exclude other Part 15 devices. Granting the current flood of UWB requests risks similar behavior in the future from manufacturers who will urge the Commission to forego future innovation and advances in spectrum efficiency in order to preserve their business models.

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In sum, we urge the Commission to avoid the *ad-hoc*, piecemeal consideration of numerous UWB waiver requests that implicate multiple spectrum bands, many of which are the subject of current rulemaking proceedings before the Commission.

Respectfully submitted,

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<sup>30</sup> See *iRobot Corporation Request for Waiver of Section 15.250 of the Commission's Rules*, Order, 30 FCC Rcd. 8377 (2015).

<sup>31</sup> *Impact of Proposed High-Power Wi-Fi Operations on iRobot Ultra Wide Band Devices at 6 GHz at 15*, as attached to Letter from Tonya Drake, VP & Assistant General Counsel for iRobot Corporation, to Marlene H. Dortch, Secretary, FCC, ET Docket No. 18-295, GN Docket No. 17-183 (filed Oct. 16, 2019).

<sup>32</sup> *Id.* at 2.

<sup>33</sup> Letter from Timothy Harrington, Executive Director of UWB Alliance, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-183 (filed Oct. 4, 2019).